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(56) Documents cited

GB 1283893 A GB 1231518 A EP 0326769 A1
EP 01316417 A2 WO 84/01917 A1 DE 003204848 A
US 48829516 A

(58) Field of search

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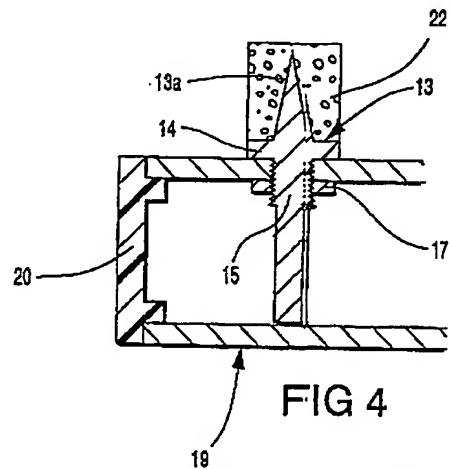
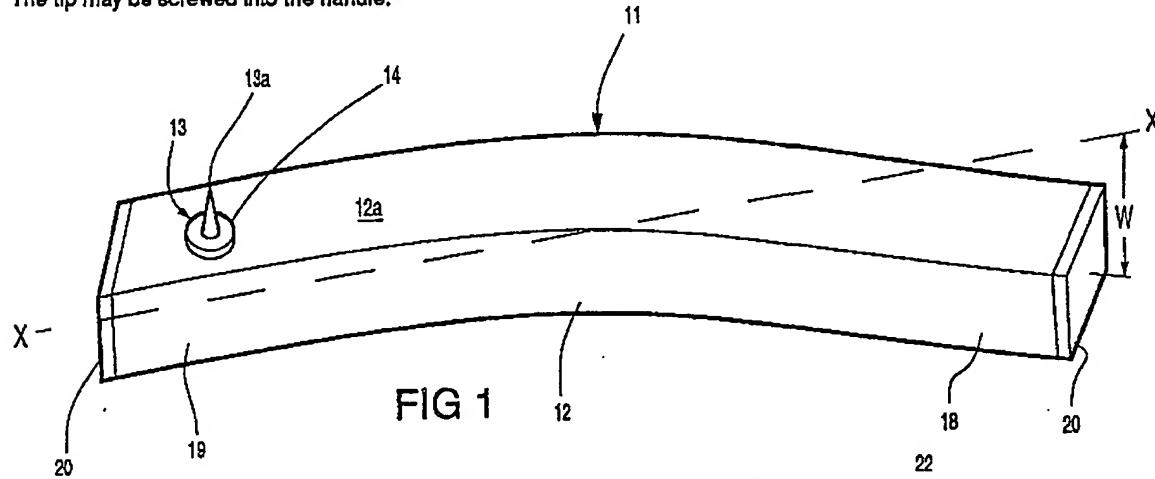
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(54) Glass breaking tool

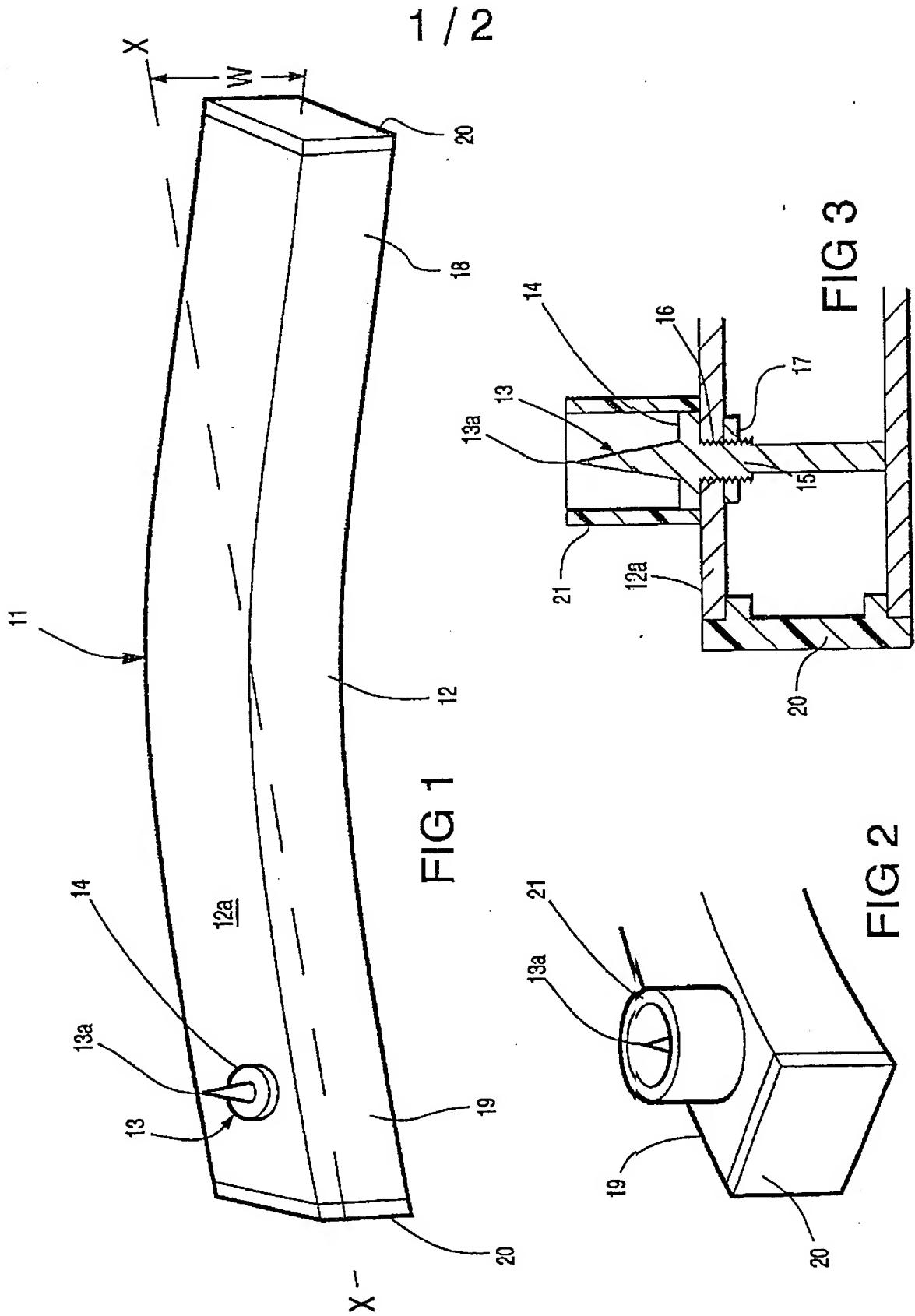
(57) A glass-breaking tool (11) comprises an elongate handle (12) carrying a sharp tip (13) at one end projecting transverse the handle. The tool (11) has sufficient weight and strength for the tip (13) to penetrate toughened glass on impact when the tool is welded manually.

The tip 13 may be surrounded by a tubular sleeve or may be encapsulated by a sponge rubber 22 to act as guards. The tip may be screwed into the handle.

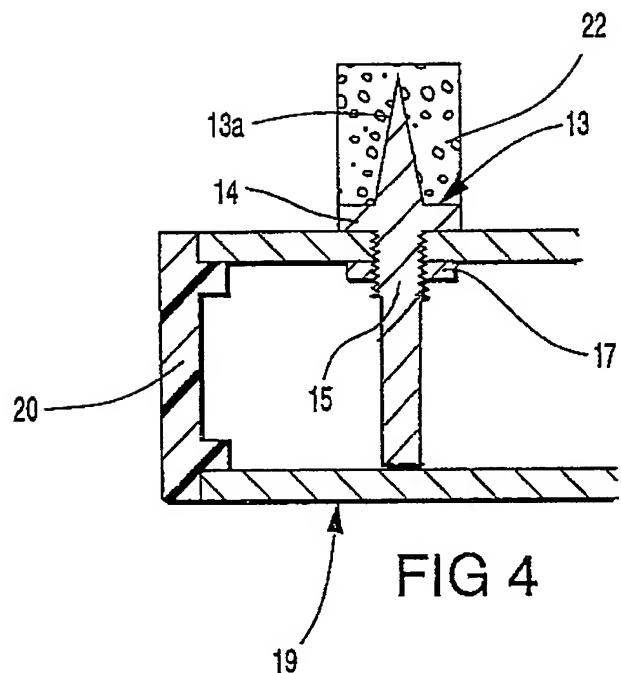


The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

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GLASS-BREAKING TOOL

The present invention relates to a glass-breaking tool, particularly for use in breaking double-glazing panels.

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Recent trends towards improving house insulation have led to the widespread use of double-glazed windows, many of which are sealed so that they cannot be opened by the home occupier. This has led to problems in emergency situations, such as fire, since there is no immediate escape-route through the windows. Attempts to break such windows with improvised tools, even chairs, have on occasion been fruitless and have led to tragic deaths.

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Now that this problem has become apparent, totally-sealed units are less-frequently fitted and older sealed units are being replaced. Such replacement is, however, extremely expensive and not everyone can afford this remedy. The object of the present invention is, therefore, to provide a simpler and cheaper alternative in the form of a glass-breaking tool.

Accordingly, the invention provides a glass-breaking tool comprising an elongate handle carrying a sharp tip at one end projecting transverse the handle, the tool having sufficient weight and strength for the tip to penetrate toughened glass on impact when the tool is wielded

manually.

In use, it is intended that the user should stand to one side of a window to be broken, and, grasping the opposite 5 end of the handle from the tip, should swing the tool round forcefully so that the tip impacts against the glass. The force exertable by the user will thus be concentrated on the extremely small area of glass hit by the pointed tip, enabling even a person who is not very strong to break at 10 least one pane of a doubled-glazed unit. The tool may be designed for use by women of less than average strength or by children of upwards of a selected age group. It will be appreciated that more than one blow will probably be needed to break through both panes of a double-glazed unit.

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In order to avoid the user knocking his hand against the window or against an adjacent wall surface, in use, the end of the handle remote from the pointed tip, which constitutes the hand grip, is preferably offset from the 20 axis of that end of the handle carrying the tip, in a direction away from the tip. For this purpose, the handle may be cranked but is preferably angled or has a slight curvature.

25 It will be appreciated that the tip of the tool must have sufficient strength to withstand the intended impact, in use, so that it can transfer the force of the impact to the

glass rather than being itself broken or deformed. The preferred material is steel although other materials would be suitable. The handle is preferably also of steel although again other materials, such as wood, could be used. The handle may be solid but is conveniently tubular. The tip must be securely fixed to the handle but the means of fixing may be determined by the nature of the materials both of the handle and the tip.

10 The glass-breaking tool of the invention need not be very large and may conveniently be stored adjacent or beneath a window, perhaps behind a curtain, there preferably being one tool in each room in a building having fully-sealed windows. A housing may be provided for the tool and may be designed to fit aesthetically with the room furnishings or may be recessed into the window frame or into a wall adjacent the window so that the tool is at least substantially concealed.

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20 The tip of the tool must be sharp to be effective, and it is therefore preferably protected by a guard so that, during installation or when the tool is removed from storage, whoever has removed it will not injure himself or any of the room furnishings accidentally. The protection may be in the form of a removable cover but since its removal would immediately negate its purpose, this is not a preferred form of protection. Moreover, if the cover were

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difficult to remove in order to deter removal other than in an emergency, then this would in itself delay the use of the tool in the event of an emergency.

5 In a preferred embodiment of the invention, the guard is not readily-removable but is able to yield if the tool is swung sufficiently forcefully against a hard object, such as a window, so as to enable the tip to penetrate the object. The guard may, for example, comprise a generally 10 cap-shaped cover of relatively thin and/or brittle material which will deform or fracture on impact without absorbing much of the energy imparted by the blow so that the tool is still effective in breaking toughened glass. Preferably the guard is resiliently-deformable and may, for example, 15 be in the form of a body which encapsulates the tip or preferably in the form of a sleeve which surrounds the tip and whose open end is substantially flush with the tip itself or projects slightly beyond the tip.

20 The invention will now be more particularly described, by way of example, with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a tool according to the invention shown without a guard;

25 Figure 2 is an enlarged perspective view of one end of the tool of Figure 1, shown with a guard in place;

Figure 3 is an axial-section through the part of the

tool shown in Figure 2; and

Figure 4 is a view similar to Figure 3 but showing a variant of the guard.

5 With reference to Figure 1 of the drawings, a glass-breaking tool is shown generally indicated 11 and comprises a square-section steel tube 12 which is approximately 450mm long, with an external sectional dimension of approximately 20mm and a wall thickness of about 2 to 3mm, although these 10 dimensions are not critical and should not be considered as limiting of the invention.

15 Adjacent one end, the tube 12 has a portion of a pin 13 projecting orthogonally from one wall 12a thereof. The pin 14 has a conically-tapered, sharp tip 13a, a radially-projecting coaxial flange 14 adjoining the base of the tip 13a and a threaded shank 15 projecting coaxially from the flange 14 in the opposite direction from the tip 13a. The shank 15 is screwed into a cooperating threaded aperture 20 16 in the wall 12a so that the flange 14 abuts the outer surface of this wall and is further secured by a nut 17 screwed onto its end within the tube 12. It will be appreciated that the shank 15 may be a self-tapping screw, the nut 17 may be omitted, the aperture 16 may have a smooth wall and the pin 13 may be secured solely by the nut 17 or the pin 13 may be secured by welding or other means, 25 the pin being suitably adapted for such other attachment.

In a preferred embodiment of the invention shown in Figure 4, the shank, indicated 14a, of the pin 13 is longer than that shown in Figure 3 and extends into contact with the wall of the tube 12 opposite the wall 12a.

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The tube 12 is bent such that its end portion 18 remote from the end portion indicated 19 carrying the pin 13 is spaced from the longitudinal axis indicated X-X of the end portion 19. The curvature of the tube 12 is exaggerated, 10 for clarity, in Figure 1: in practice, the distance W between the centre of the free end of the tube 12 and the axis X-X is only about 12mm, the end portion being deflected from the axis X-X in the opposite direction from the projection of the pin 13.

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The ends of the tube 12 are closed by plastic caps 20.

With reference to Figures 2 and 3 of the drawings, a tubular sleeve 21 is shown circumferentially surrounding 20 the tip 13a of the pin 13. The sleeve 22 is of a resilient rubber material and is a close fit around the shoulder 14: the sleeve 22 may be retained by its own resilience or may be bonded by adhesive or vulcanizing to the shoulder 14. It is preferably fitted to the shoulder before the pin 13 25 is screwed into its seat 16. The free end of the sleeve 20 projects slightly beyond the free end of the tip 13a: the projection is exaggerated in Figure 3.

With reference to Figure 4, this shows an alternative form of guard for the tip 13a. In this case, the guard comprises a cylindrical body 22 of sponge rubber which encapsulates the tip 13a. The point of the tip 13a is spaced only slightly from the end surface of the body 22.

The tool shown in the drawings may be housed adjacent a window for use in an emergency. During installation, or at any time at which it is removed, the guard 21 or 22 will protect the user from accidental injury by the sharp tip 13a. In an emergency, however, when it is wished to break a window, the tool may be grasped by the end 18 of the tube 12 and swung so that the tip 13a impacts forcefully against the glass. The guard 21 or 22 will deform readily on such impact so that the tip 13a itself contacts the glass. Sufficient force may be applied with the aid of the tool 11 to penetrate at least one pane of glass. The shattered glass may then be removed, possibly after further blows with the tool 11, and the tool 11 may then be used to penetrate the second pane of a double-glazed unit in order to break the window completely.

The handgrip 18 of the tool is offset sufficiently from the axis X-X of the opposite end 17 to enable the user to avoid injuring himself, for example against an adjacent wall, when swinging the tool 11. Obviously it is preferable for the user to wrap his hand with a strip of fabric in order

to protect himself from any broken glass. The square-section of the tube enables the user to get a good grip on the tool even with his hand wrapped in such fabric.

- 5 It is envisaged that a tool 11 having a weight of about 400-500g (about 16oz) will suffice for the purpose, giving a pressure of the tip 13a on the glass, in use, of between about 15 and 70kg/mm² (about 18,000lb/in² - 90,000 lb/in²).

CLAIMS

1. A glass-breaking tool comprising an elongate handle carrying a sharp tip at one end, projecting transverse the handle, the tool having sufficient weight and strength to penetrate toughened glass on impact when the tool is wielded manually.
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2. A glass-breaking tool as claimed in Claim 1, in which the end of the handle remote from the pointed tip, which constitutes the hand grip, is offset from the axis of that end of the handle carrying the tip, in a direction away from the tip.
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3. A glass-breaking tool as claimed in Claim 2, in which the handle is cranked.
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4. A glass-breaking tool as claimed in Claim 2, in which the handle has a curvature along its length.
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Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

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GB 9207928.4

Relevant Technical fields

(i) UK CI (Edition 1) B4C

Search Examiner

M SIDDIQUE

(ii) Int CI (Edition 5) B25D

Databases (see over)

(i) UK Patent Office

Date of Search

17 MAY 1993

(ii) ONLINE DATABASES: WPI

Documents considered relevant following a search in respect of claims

1-4

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 1283893 (PENBERTHY) elongate member 12 with a tip projection at one end	1
X	GB 1231518 (HAGQVIST) page 1 line 13, drawings	1
X	EP 0326769 A1 (NIVET) Figure 1	1
X	EP 0131647 A2 (KANTWERK) Figure 1, pointed region on member 2	1,2
X	WO 84/01917 A1 (LECHNER) Figure 1 etc	1
X	US 4882956 (LANG) projecting tip 3	1
X	DE 3204848 A (LOTHAR LAFLOR) see Figures 1 and 2	1

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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